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The Crustacean Plankton of Lake Winnipeg, June to October, 1969

A.G. Salki and K. Patalas

Central and Arctic Region
Department of Fisheries and Oceans
Winnipeg, Manitoba R3T 2N6

1992

Canadian Data Report of
Fisheries and Aquatic Sciences
868

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by

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This is the 71st Data Report

from the Central and Arctic Region, Winnipeg

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Cat no. 97-13/868E ISSN 0706-6465

Correct citation for this publication is:

Salki, A.G., and K. Patalas. 1992. The crustacean plankton of Lake Winnipeg, June to October, 1969. Can. Data Rep. Fish. Aquat. Sci. 868: iv + 16 p.

92-06071/

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ABSTRACT

Salki, A.G., and K. Patalas. 1992. The crustacean plankton of Lake Winnipeg, June to October, 1969. Can. Data Rep. Fish. Aquat. Sci 868: iv + 16 p.

The species composition and abundance of the crustacean plankton community found in Lake Winnipeg on six sampling cruises during the period June to October, 1969 are given. Total settled volume of the net plankton collected on these cruises is also reported.

Key words: Lake Winnipeg; zooplankton; seasonal distribution; species composition; abundance.

RÉSUMÉ

Salki, A.G., and K. Patalas. 1992. The crustacean plankton of Lake Winnipeg, June to October, 1969. Can. Data Rep. Fish. Aquat. Sci. 868: iv + 16 p.

Ce rapport présente la composition spécifique et l'abondance de la communauté des crustacés planctoniques du lac Winnipeg, telles qu'établies après six campagnes d'échantillonnage qui ont eu lieu de juin à octobre 1969. Le volume total au repos du microplancton prélevé lors de ces campagnes est également indiqué.

Mots clés: Lac Winnipeg; zooplancton; distribution saisonnière; composition spécifique; abondance.

INTRODUCTION

Lake Winnipeg, with a surface area of 23, 750 km² (Brunskill et al. 1980) is the largest remnant of glacial Lake Agassiz in western Canada. A limnological study of the lake was conducted in 1929 by Bajkov (1930) who described biological conditions, including the zooplankton community, existing at that time. In 1969, the Freshwater Institute undertook a study to characterize the physical, chemical and biological conditions of Lake Winnipeg (see Brunskill et al. 1979; Brunskill et al. 1980; Brunskill and Graham 1979; Brunskill, Schindler, Elliott et al. 1979; Brunskill, Schindler, Holmgren et al. 1980; Kenny 1979). During the intervening 40 years, Lake Winnipeg received increased nutrient loads from municipal and agricultural sources and became a regulated storage reservoir for hydroelectric power generation. Brunskill et al. (1980) describe the regional economic growth, the increased fertilizer application and the flow and level regulation impacting the lake since 1950. The purpose of this report is to document the basic data on species composition and abundance of the crustacean plankton community found in Lake Winnipeg during the period June to October, 1969. A thorough description of the spatial and temporal distributions of species and an assessment of factors affecting these variations is presented in Patalas and Salki (1992). The publication also includes a consideration of the observed differences between this study and that of Bajkov.

METHODS

Zooplankton samples were collected from a network of 59 stations located within eight regions of Lake Winnipeg: R, W, SB (comprising the South Basin), N (Narrows separating the South and North Basins), and NBw, NBe, NBn, S (comprising the North Basin) (Fig. 1). Regionalization was based on geographic, morphometric and hydrologic features of the lake and allowed an evaluation of the effects of these parameters of plankton distributions and dynamics. Samples to study the seasonal dynamics of zooplankton were obtained during six lakewide cruises over the period June 4 to October 31, 1969.

Cruise 1	June 4-12	36 stations
Cruise 2	July 9-16	51 stations
Cruise 3	July 24 - August 1	49 stations
Cruise 4	September 2-10	37 stations
Cruise 5	October 3-13	49 stations
Cruise 6	October 27-31	25 stations

Although the number of stations sampled in each cruise varied due to weather conditions, the lake area represented by each station in North Basin regions was roughly comparable as were those in the South Basin regions (see Patalas and Salki 1992).

At each station during daylight hours, a Wisconsin net of 25 cm mouth diameter and 73 μm mesh size was hauled vertically from just above the lake bottom to the surface at a rate of 0.5 $m \cdot s^{-1}$. Plankton samples were preserved in 10% formalin.

In the laboratory, net plankton volumes were measured after 24 hr settling in 8 x 600 mm glass tubes following the method of Bajkov (1930, 1934). Quantitative and qualitative analysis of zooplankton samples were conducted using a 63x compound microscope. At least 200 individuals were counted in 1 mL subsamples withdrawn from 40 mL samples using a calibrated 4 mm I.D. glass tube and placed in a Sedgwick-Rafter counting cell. This method provided estimates of total abundance with counting errors not exceeding 7%. Generally, more than 40 individuals of each dominant species were counted as recommended by Cassie (1971). All mature specimens and immature cyclopoid copepodids were identified to species using keys of Yeatman (1959), Wilson (1959), and Brooks (1957). Calanoid copepodids I-V, enumerated collectively, were apportioned among calanoid species in accordance with the relative abundance of adults present in the sample. Copepod nauplii were identified to family Cyclopidae and to sub-order Calanoida. Larger and/or rarer animals (Leptodora, Limnocalanus, Holopedium, etc.) were enumerated in the whole or a large (¼-½) fraction of the sample under a 12x dissecting microscope. Zooplankton abundance was expressed as the number of specimens perlitre, assuming the filtration efficiency of the net to be 100%. In fact, the efficiency was between 45 and 85%, averaging 63%, as indicated by later experiments. The South

and North Basin means presented for each cruise were considered to be weighted since stations within the South Basin regions represented comparable lake areas as did those in North Basin regions.

DATA SUMMARY

Tables 1 to 6 provide data on the composition and abundance per litre of the crustacean plankton community at individual stations in Lake Winnipeg during six sampling cruises in 1969. Weighted mean total abundances in the South and North Basins as well as the abundance of cyclopoid copepods, calanoid copepods and cladocerans found at each station during each cruise are also presented. Table 7 presents the settled net plankton volumes in lake Winnipeg during the period June to October, 1969.

ACKNOWLEDGMENTS

We thank the crew of the S.S. Bradbury and staff of the Freshwater Institute led by Dr. Gregg Brunskill for the many hours spent collecting the zooplankton samples for this report.

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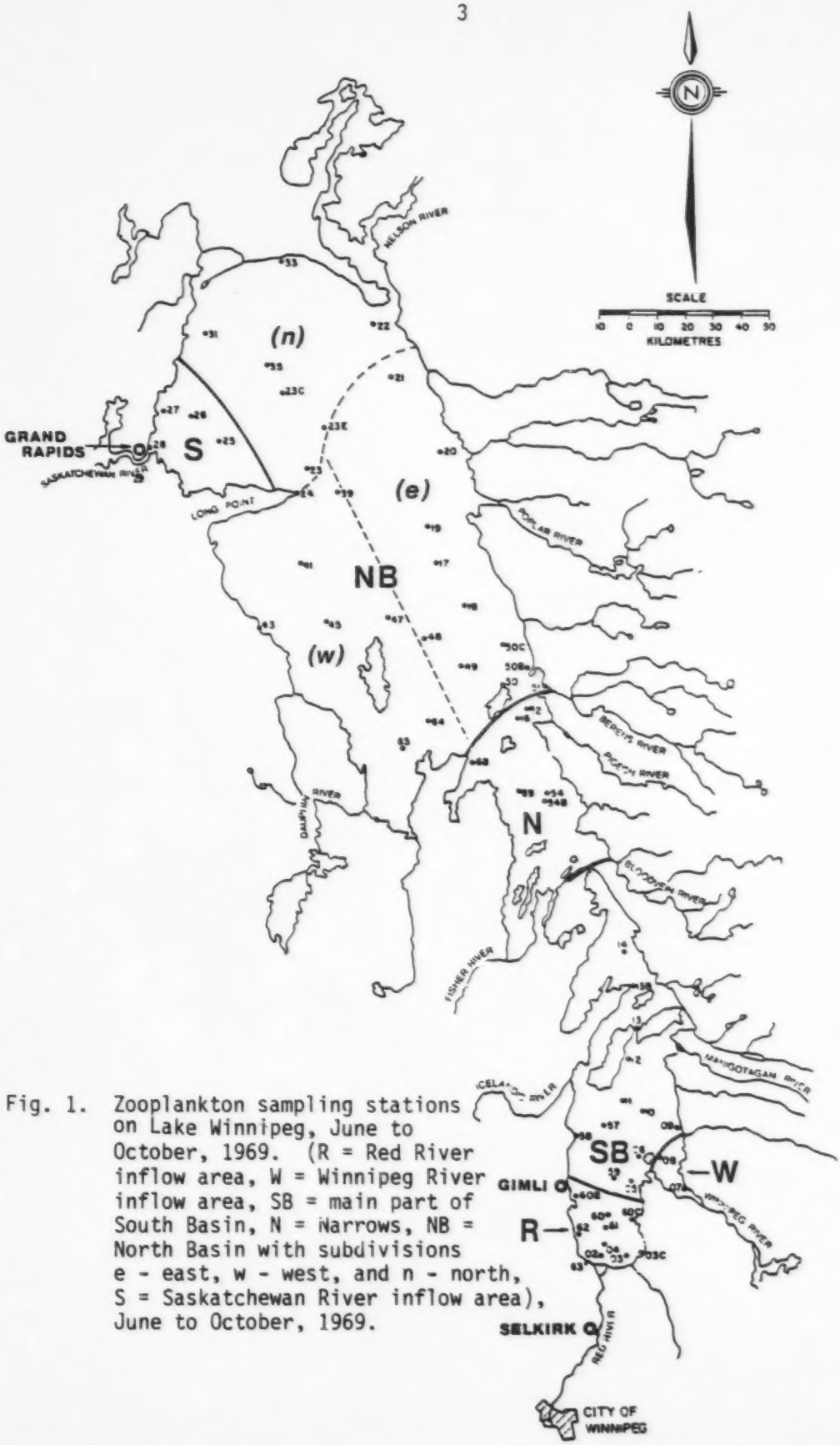

Fig. 1. Zooplankton sampling stations on Lake Winnipeg, June to October, 1969. (R = Red River inflow area, W = Winnipeg River inflow area, SB = main part of South Basin, N = Narrows, NB = North Basin with subdivisions e - east, w - west, and n - north, S = Saskatchewan River inflow area), June to October, 1969.

Table 1. Abundance (individuals per litre) of crustacean plankton species at 36 stations in 8 regions of Lake Winnipeg, June 4 - 12, 1969. South and North Basin means (weighted) also provided.

Region	R					SB							W		South Basin (R, SB, W) (n = 19)
Station	2	60	61	62	63	5	6	10	12	13	57	59	7	8	MEAN
SPECIES															
L. macrurus				0.03	0.06		0.02		0.07	0.14	0.01		0.02	0.02	0.026
E. lacustris		0.21	0.12	1.34				1.17	0.18	0.18	2.61	0.68			0.464
E. nevadensis	0.12	2.96	1.05	6.05	2.43	0.47	0.32	3.52	0.55	0.54		0.68			1.335
D. ashlandi		8.97	5.56	14.64	7.42	0.28	1.53	3.71	4.22	3.51	7.27	7.3			4.601
D. oregonensis	3.34					0.16									0.250
D. siciloides	0.34						0.22	1.23		0.22					0.144
D. sicilis															
D. minutus															
D. leptopus															
D. clavipes													0.03	0.021	0.004
Diaptomidae copepodids	8.9	4.84	1.8	12.15	9.16	2.62	0.44	10.17	13.23	7.68	8.08	2.99	0.04	0.01	5.865
Calanoida nauplii	0.52	0.24	0.65			3.49	2.18	1.45		0.1		0.74	0.01	0.02	0.671
D. c. bicuspidatus	27.24	1.21	2.79	2.8	2.4	27.47	7.41	4.94	1.01	0.21	0.17	2.43	0.07	0.06	5.729
A. vernalis															
M. edax															
M. albidus					0.22		0.15		0.15	0.21					0.054
E. agilis	0.03														
Cyclopidae copepidids	5.24	11.14	6.21	8.42	6.1	9.59	10.25	6.97	1.89	2.28	3.07	7.1	0.12	0.09	5.605
Cycopidae nauplii	49.78	17.44	15.55	14.02	13.32	50.58	15.04	20.93	6.83	3.73	8.08	20.95	0.13	0.11	16.892
D. retrocurva	0.01	0.49	0.81	0.02		0.454	0.06	0.05	0.01	0.01	0.07	0.38	0.01	0.01	0.170
D. g. mendotae		0.01		0.01			0.03			0.01	0.01	0.02	0.01		0.007
D. longiremis															
D. parvula	0.01														0.001
D. ambigua															
D. pulex		0.02			0.01							0.01			0.003
D. schoedleri	0.03					0.01	0.06								0.007
C. quadrangula					0.03		0.02				0.16	0.19			0.029
S. vetulus															
B. longirostris	1.04	0.24		1.25	0.22		0.03	0.29	1.16	0.72	0.97	0.93			0.489
C. sphaericus															
H. gibberum								0.01		0.1					0.009
D. leuchtenbergianum		0.02													
S. crystallina								0.001	0.013						0.004
L. kindtii			0.019	0.025											
A. guttata															
L. quadrangularis															
E. lamellatus															
L. setifera															
TOTAL CALANOIDA	ind L-1 12.70	16.98	8.53	34.21	19.07	3.53	2.53	19.80	18.25	12.27	17.97	11.65	0.09	0.05	12.69
TOTAL CYCLOPOIDA	ind L-1 82.81	30.03	25.20	25.24	22.04	91.13	35.03	34.29	9.88	6.53	11.32	31.22	0.33	0.28	28.95
TOTAL CLADOCERA	ind L-1 1.09	0.78	0.83	1.31	0.26	0.46	0.20	0.35	1.18	0.84	1.21	1.53	0.02	0.01	0.72
TOTAL CRUSTACEANS	ind L-1 96.60	47.79	34.56	60.76	41.37	95.12	37.76	54.44	29.31	19.64	30.50	44.40	0.44	0.34	42.36

Table 1 (cont.).

Region	Narrows			NBw			NBe					NBn								S			NORTH BASIN (NBw, NBe, NBn, S) (n = 19)
Station	16	52	54	39	45	47	48	17	18	19	21	22	23e	24	31	33	35	41	43	25	26	28	
SPECIES																							Mean
L. macrurus	0.24	0.02	0.06	0.31	0.09	0.1	0.69	0.74	0.12	0.42	1.01	0.62	0.49	0.03	0.01	0.06	0.11	0.02	0.03	0.03	0.01	0.01	0.258
E. lacustris	0.19	3.7	2.47																0.03			0.61	0.034
E. nevadensis			2.47																			0.12	0.006
D. ashlandi	4.86	9.61	11.86	2.18	0.34	0.56	6.16	1.17	2.2	0.31	1.46	0.82	0.35	0.34	2.23	2.18	0.58	0.62		2.58	0.91	5.56	1.608
D. oregonensis																							
D. sicilioides																							
D. sicilis																							
D. minutus																							
D. leptopus																							
D. clavipes																							
Diaptomidae copepodids																			0.66				0.035
Calanoida nauplii	0.47	4.3	3.06	6.68	1.35	3.91	11.53	6.04	10.93	5.66	2.69	7.89	3.39	2.46	3.4	2.5	2.77	2.91	3.28	5.46	6.04	2.95	4.834
D. c. bicuspidatus	0.28	0.41	0.41	0.68	3.18	3.02	0.26	0.23	0.33	0.36	0.12	0.41	0.12	0.51	2.09	0.47	3.13	2.08	3.6	1.15	2.11	1.31	1.324
A. vernalis	0.19	2.05	2.05	0.76	1	2.35	0.64	0.14		0.05	0.03	0.06	1.01	0.08	0.39	0.15	2.18	0.21	0.98	0.15	0.3	1.31	0.620
M. edax																							
M. albidus																							
E. agilis																							
Cyclopidae copepodids	2.9	4.5	4.5	0.54	0.84	0.78	1.28	0.37	0.22	0.26	0.12	0.23	0.39	0.34	1.44	1.08	1.02	0.41	6.86	2.01	1.41	8.13	1.462
Cyclopidae nauplii	5.42	12.68	14.31	4.43	21.8	6.71	3.46	1.73	2.53	1.51	0.82	3.79	0.86	13.67	18.72	21.67	2.69	14.84	51.04	43.69	9.77	45.8	14.186
D. retrocurva		0.61	0.41		0.01																		0.001
D. g. mendotae	0.09	0.2		0.03		0.01	0.01		0.02		0.01			0.01	0.02	0.05		0.02	0.03	0.01	0.01		0.012
D. longiremis														0.08			0.01			0.15		0.04	0.015
D. parvula																							
D. ambigua																							
D. pulex																							
D. schoedleri																							
C. quadrangula																							
S. vetulus																							
B. longirostris	0.28	1.03	2.45	0.34		0.45					0.03	0.06		0.08			0.58	0.31	0.32	2.3	1.11	0.33	0.311
C. sphaericus																				0.86		1.64	0.132
H. gibberum																							
D. leuchtenbergianum			0.2																				
S. crystallina																							
L. kindtii		0.060	0.040											0.014								0.005	0.001
A. guttata																							
L. quadrangularis																							
E. lamellatus																							
L. setifera																							
CALANOIDA TOTAL ind L-1	5.76	17.63	19.92	9.17	1.78	4.57	18.38	7.95	13.25	6.39	5.16	9.33	4.23	2.83	5.64	4.74	3.46	3.55	4.00	8.07	6.96	9.25	6.77
CYCLOPOIDA TOTAL ind L-1	8.79	19.64	21.27	6.40	26.82	12.86	5.64	2.47	3.08	2.18	1.09	4.49	2.38	14.60	22.64	23.37	9.02	17.54	62.48	47.00	13.59	56.60	17.59
CLADOCERA TOTAL ind L-1	0.37	1.90	3.10	0.37	0.01	0.46	0.01		0.02		0.04	0.06		0.18	0.02	0.05	0.59	0.33	0.35	3.32	1.12	2.02	0.47
TOTAL CRUSTACEANS ind L-1	14.92	39.17	44.29	15.94	28.61	17.89	24.03	10.42	16.35	8.57	6.29	13.88	6.61	17.61	28.30	28.16	13.07	21.42	66.83	58.39	21.67	67.87	24.84

Table 2. Abundance (individuals per litre) of crustacean plankton species at 56 stations in 8 regions of Lake Winnipeg, July 9 - 16, 1969. South and North basin means (weighted) also provided.

Region	R										SB											W		South Basin (R, SB, W) (n = 23)
Station	1	2	3	3c	4	60	60b	61	62	63	5	6	9	10	11	12	13b	14	57	58	59	7	8	Mean
SPECIES																								
L. macrurus												0.01		0.01		0.01	0.03							0.003
E. lacustris		1.38	0.13	1.18	0.13	0.25	0.03	0.18	1.26		0.66	0.39	3.19	4.94	2.09	0.08	1.92	0.90	0.33	0.91	0.70		0.42	0.916
E. nevadensis		1.65	2.11	1.05	0.25	1.48	0.04	0.13	0.43	0.38	0.79	0.31		2.14	0.32	0.01	0.12		0.39	0.70	2.16		0.21	0.638
D. ashlandi		8.92	5.10	4.15	11.09	5.70	6.37	6.77	5.60	18.19	31.27	7.60	1.66	11.12	11.14	4.82	7.14	5.56	3.65	11.65	17.60		0.01	8.180
D. oregonensis	0.46	0.88	0.86	1.04	0.53		0.02		0.44		5.86	1.34	0.83	2.14	2.57		0.31	0.40		0.58	0.88		0.02	0.833
D. siciloides				0.69																				0.030
D. sicilis																				0.58				0.025
D. minutus																								
D. leptopus																								
D. clavipes			0.01																					0.000
Diaptomidae copepodids																						0.03		0.001
Calanoida nauplii	10.60	11.62	7.56	20.36	49.39	37.42	37.32	44.16	7.64	36.87	25.64	29.81	39.50	41.03	41.57	10.36	22.65	30.88	15.48	14.83	37.77	0.16		24.980
D. c. bicuspidatus						0.36				0.72		0.34			1.33	1.93	2.21	0.33	0.15	1.48				0.386
A. vernalis	15.02	5.38	12.86	1.73	1.25	0.38	0.49	0.30	14.07	7.85	4.42	1.33	2.21	8.70	1.33	2.17	1.66	5.64	2.13	0.43	7.64		0.16	4.224
M. edax																								
M. albidus															3.09								0.06	0.153
E. agilis			0.38																					
Cyclopidae copepodids		0.48	0.38	0.18	1.66	0.38	0.49		0.80	0.36	0.44	1.00		1.24	1.77	3.85	2.21	2.32	1.36	1.25	2.41	9.00	0.29	1.386
Cyclopidae nauplii	47.30	5.63	18.14	4.67	4.15	3.21	4.18	7.07	12.85	6.06	0.44	3.31	5.53	4.14	9.73	13.97	10.50	17.60	2.13	3.75	5.23		0.91	8.283
D. retrocurva	0.10	10.30	17.00	6.58	12.45	3.97	2.70	4.72	20.09	0.72	15.03	14.25	4.70	9.54	8.85	3.14	6.35	2.85	1.67	1.48	16.07	0.01	0.12	7.065
D. g. mendotae	0.01	0.25							0.80								0.03							0.047
D. longiremis																								
D. parvula																								0.017
D. ambigua			0.38																					0.001
D. pulex		0.02																						0.036
D. schoedleri									0.80						0.02									0.034
C. quadrangula			0.38						0.40															
S. vetulus																								
B. longirostris	5.30	2.93	12.10	4.33	0.83	0.57	0.24	0.30	8.44	3.92	1.77	3.98	1.10	12.43	13.71	5.78	1.11	3.98	3.49	3.15	1.61		0.22	3.969
C. sphaericus																								
K. gibberum																							0.03	0.217
D. leuchtenbergianum	0.22	0.25		0.18	0.06			0.17	0.40	1.55	0.44	1.33	0.18	0.04		0.01	0.03	0.09						
S. crystallina																								0.040
L. kindtii	0.120	0.020		0.02		0.030			0.020	0.060		0.110	0.130	0.006	0.050	0.080	0.13	0.110		0.030				0.019
A. guttata	0.44																							
L. quadrangularis																								
E. lamellatus																							0.03	0.001
L. setifera																								
CALANOIDA TOTAL ind L-1	11.06	24.35	15.77	28.49	61.39	47.85	43.78	51.24	15.37	57.44	64.22	39.46	45.18	61.38	57.69	15.28	32.17	37.76	19.85	29.25	59.11	0.19	0.66	35.61
CYCLOPOIDA TOTAL ind L-1	62.32	11.49	31.76	6.58	7.06	4.35	5.16	7.37	27.72	14.99	5.30	5.98	7.74	14.08	17.25	21.92	16.58	25.89	5.77	6.91	15.26	9.00	1.42	14.43
CLADOCERA TOTAL ind L-1	6.19	13.77	29.86	11.11	13.34	4.57	2.94	5.19	30.95	6.25	17.24	19.67	6.11	22.02	22.63	9.01	7.65	6.83	5.16	4.66	17.68	0.01	0.40	11.45
TOTAL CRUSTACEANS ind L-1	79.57	49.61	77.39	46.18	81.79	56.77	51.88	63.80	74.04	78.68	86.76	65.11	59.03	97.48	97.57	46.21	56.40	70.48	30.78	40.82	92.07	9.20	2.48	61.48

Table 2 (cont.).

Region	Narrows					NBw				NBe									NBn						S			North Basin (NBw,NBe,NBn,S)
Station	68	69	52	54	16	39	64	45	41	17	18	19	20	21	48	50	50c	51	22	23c	23e	31	33	35	25	26	27	28	(n = 28)
SPECIES																													Mean
L. macrurus	0.16	0.05	0.06	0.01	0.06		0.41	0.01	0.01	0.08	0.16	0.18	0.16	0.56	0.31	0.06	0.01		0.01		0.17		0.01	0.07				0.01	0.091
E. lacustris	0.01	0.77	0.17	0.32	0.81			0.44	0.44	0.05		0.01	0.36		0.02	0.16	0.12				0.01	0.01	0.22	0.42	0.01		0.52	0.51	0.192
E. nevadensis	0.02	0.29	0.13	0.02	0.11	0.4				0.15		0.01	0.36	0.84		0.05	0.1		4.47	1.59	0.77	0.05	0.45		0.04	0.07	1.05	0.09	0.395
D. ashlandi	6.99	13.75	2.74	11.7	8.42	0.65	1.05	1.05	1.33	3.73	1.51	2.79	23.69	3.24	0.6	4.03	4.76	0.01	4.21	0.06	2.08	1.81	2.22	2.9	0.44	0.91	1.23	1.35	3.903
D. oregonensis		0.69	0.13	0.69	0.8			0.04								0.21	0.19											0.11	0.102
D. siciloides						0.07																						0.11	0.006
D. sicilis				0.69		0.07				0.09																			0.030
D. minutus																				0.01								0.11	0.004
D. leptopus																													
D. clavipes																													
Diaptomidae copepodids																													
Calanoida nauplii	33.47	14.61	7.09	35.64	15.21	3.51	5.8	3.64	1.77	6.11	2.93	5.64	5.55	2.9	9.05	17.41	30.93		4.43	3.12	4.03	0.6	8.67	2.9	2.21	1.83	2.86		8.279
D. c. bicuspidatus	0.73	0.62	0.09		1.66		0.83	0.58	0.89	0.34	0.03	0.42	0.36	0.25	0.11	0.27	0.35		1.99	3.12	0.13	1.21		0.41	0.44	2.29	0.27	0.48	0.642
A. vernalis	3.36	2.24	0.48	4.42	0.56	0.78	0.74	0.15	0.89	0.51	0.15	0.78	0.63	0.99	0.39		1.03		3.1										0.764
M. edax																													
M. albidus																													
E. agilis																													
Cyclopidae copepodids	1.02	0.69	0.19	0.92	0.74	20.66	1.99	8.87	21.22	2.72	0.86	2.44	4.84	4.39	3.3	0.94	1.89		30.78	120.07	10.53	23.51	6.67	22.78	42.01	37.49	20.06	5.3	14.175
Cyclopidae nauplii	2.33	3.44	4.35	6.63	4.08	44.4	4.14	36.2	42.45	1.44	0.74	2.08	3.07	1.83	1.96	4.18	2.75		5.1	154.38	6.37	82.57	24.01	47.24	53.51	84.12	10.58	11.33	23.046
D. retrocurva	0.56	0.34	0.86	1.66	0.19	0.39	0.09	0.44	0.44			0.24	0.24		0.06	1.22	0.52	0.01		1.56			0.22				1.37	1.44	0.424
D. g. mendotae					0.56	1.17	0.09	0.29						0.08	0.06	0.13	0.17										0.27	1.93	0.170
D. longiremis						2.34																			0.44			5.06	0.280
D. parvula																													
D. ambigua																													
D. pulex																													
D. schoedleri																													
C. quadrangula																													
S. vetulus																													
B. longirostris	1.31	0.52	1.04	1.29	1.49	3.12	0.74	4.65	10.61	0.17		0.12	0.36	0.58	0.39	1.09	1.72	0.02	3.32	17.15	2.6	5.43	1.33	11.6	1.77	15.54	1.09	7.71	3.456
C. sphaericus									0.44																	0.46		0.48	0.049
H. gibberum																													
D. leuchtenbergianum								0.02																				0.98	0.036
S. crystallina																													
L. kindtii	0.010	0.009	0.010	0.008	0.040							0.006				0.006	0.030							0.006		0.030	0.100	0.050	0.011
A. guttata																													
L. quadrangularis																													
E. lamellatus																													
L. setifera																													
CALANOIDA TOTAL ind L^{-1}	40.64	30.16	10.32	48.97	25.41	4.70	7.26	5.16	3.55	10.21	4.60	8.63	30.12	7.54	9.96	21.92	36.13	0.01	13.12	4.78	7.06	2.47	11.57	6.29	2.70	2.81	5.66	2.29	13.00
CYCLOPOIDA TOTAL ind L^{-1}	7.43	6.89	5.11	11.97	7.24	65.84	7.70	45.80	65.45	5.01	1.78	5.72	9.10	7.46	5.76	5.39	6.02		40.97	277.57	17.03	107.29	30.68		95.96	123.90	30.93	17.11	38.63
CLADOCERA TOTAL ind L^{-1}	1.90	0.67	1.91	2.96	2.28	7.02	0.92	5.40	11.49	0.17		0.37	0.60	0.66	0.51	2.45	2.44	0.03	3.32	18.71	2.60	5.43	1.55	11.61	2.21	16.03	2.63	17.63	4.42
TOTAL CRUSTACEANS ind L^{-1}	49.97	37.92	17.34	63.90	34.93	77.56	15.88	56.36	80.49	15.39	6.38	14.72	39.82	15.66	16.25	29.76	44.59	0.04	57.41	301.06	26.69	115.19	43.80	88.33	100.87	142.74	39.42	37.03	56.05

Table 3. Abundance (individuals per litre) of crustacean plankton species at 50 stations in 8 regions of Lake Winnipeg, July 24 - August 1, 1969. South and North basin means (weighted) also presented.

Region	R									SB								W		South Basin (R,SB,W) (n = 19)
Station	3	3c	4	60	60b	60c	61	62	63	5	6	9	12	14	57	58	59	7	8	Mean
SPECIES																				
L. macrurus					0.04			0.07												0.01
E. lacustris	0.23	2.72	0.71	1.46	2.4	0.39	1.52	5.07	0.7	2.29	4.94	11.31	3.14	1.88	3.78	0.53	1.81		1.65	2.45
E. nevadensis	1.41	8.12	5.91	10.21	3.54	5.07	3.94	3.95	2.79	9.14	9.18	0.47	1.79	5	0.79	0.33	4.37		2.75	4.145
D. ashlandi	15.22	20.88	29.02	16.3	48.21	30.94	19.33	89.3	39.14	13.06	10.1	9.8	14.7	20.21	14.78	86.35	11.52	0.13	1.58	25.819
D. oregonensis	7.6	11.6	1.38	1.26			1.38	2.35	0.91	1.31	0.53	2.17	1.13		0.7	3.08	1.16		1.74	2.016
D. sicilloides					0.99		0.69		0.91											0.136
D. sicilis																				
D. minutus																				
D. leptopus																				
D. clavipes																				
Diaptomidae copepodids																				
Calanoida nauplii	74.94	41.82	39.24	41.97	43.73	42.48	40.99	135.53	12.99	33.53	28.24	12.8	18.3	28.37	26.05	82.55	23	0.03	20.07	39.296
D. c. bicuspidatus					0.04			2.58	0.5				1.06	2.15	0.7		0.3			0.386
A. vernalis	32.59	60.4	2.77	2.06	3.65	7.28	4.09	28.39	3.99	0.37		0.83	5.98	2.16	3.87	1.71	0.59	0.07		8.463
M. edax																				
M. albidus																				
E. agilis																				
Cyclopidae copepidids	4.88	3.08	1.1	1.38		1.82		1.29		0.37			3.17	1.72	2.82	2.58	0.89			1.321
Cycopidae nauplii	115.71	111.5	6.09		11.39	21.25	2.73	16.79	49.46	1.85	2.05	2.89	17.6	28.39	13.73	16.33	1.77		2.22	22.197
D. retrocurva	45.62	21.76	8.3	3.43	4.6	6.07	3.74	23.24	3.99	2.95	3.82	1.41	2.11	3.44	2.45	3.45	7.09	0.2	1.28	7.839
D. g. mendotae		4.64	0.09	0.02	0.65	0.61	0.02		0.01	0.02	0.17	0.02	0.02	0.07		0.13	0.12			0.347
D. longiremis																				
D. parvula																				
D. ambigua																				
D. pulex						0.61	0.46									0.87				0.102
D. schoedleri																				
C. quadrangula																				
S. vetulus																				
B. longirostris	4.88			0.34	2.73	3.03	0.91	14.17		1.48	0.59	0.41	0.35		1.05	3.44	7.37		0.73	2.183
C. sphaericus																				
H. gibberum																				
D. leuchtenbergianum	3.26	10.84	2.77	1.38	1.47	6.07	0.73	11.62	6.99	0.37	2.94	0.21	0.7	3.44	0.7	0.87	0.89		0.18	2.917
S. crystallina																				
L. kindtii	0.080	1.040	0.200	0.090	0.020	0.070	0.090	0.530	0.090	0.040	0.020	0.050	0.070	0.090	0.180	0.180	0.040			0.152
A. guttata																		0.07		0.171
L. quadrangularis	1.62	1.56																		
E. lamellatus																				
L. setifera																				
TOTAL CALANOIDA ind L-1	99.40	85.14	76.26	71.20	98.91	78.88	67.85	236.27	57.44	59.33	52.99	36.55	39.06	55.46	46.10	172.84	41.86	0.16	27.79	73.87
TOTAL CYCLOPOIDA ind L-1	153.18	174.98	9.96	3.44	15.08	30.35	6.82	49.05	53.95	2.59	2.05	3.72	27.81	34.42	21.12	20.62	3.55	0.07	2.22	32.37
TOTAL CLADOCERA ind L-1	55.46	39.84	11.36	5.26	9.47	16.46	5.95	49.56	11.08	4.86	7.54	2.10	3.25	7.04	4.38	8.94	15.51	0.27	2.19	13.71
TOTAL CRUSTACEANS ind L-1	308.04	299.96	97.58	79.90	123.46	125.69	80.62	334.88	122.47	66.78	62.58	42.37	70.12	96.92	71.60	202.40	60.92	0.50	32.20	119.95

Table 3 (cont.).

Region		Narrows					NBw						NBe								NBn							S			North Basin (NBw,NBe,NBn,S (n = 30)
Station		68	69	62	54	16	39	64	65	45	41	43	48	50b	50c	51	17	18	19	20	21	22	23c	23e	31	33	35	25	26	27	28	Mean
SPECIES																																
L. macrurus		0.08	0.06	0.08	0.03	0.04		0.04	0.65				0.03				0.03	0.03	0.45	0.22	0.04		0.03	0.46			0.01				0.02	0.076
E. lacustris		0.22	0.94	0.61	3.75	0.86	0.04	0.05	1.29	0.15	0.24	0.31	0.08	2.22	0.12	0.05		1.01	0.02	0.17	0.04	0.01	0.01	0.31	0.05	0.31	0.01		0.03	0.11	0.04	0.432
E. nevadensis		0.45	1.51	0.62	1.41	0.86	0.04	0.03	4.51	0.11	0.07	0.16	0.1	0.37	0.06		0.02	0.6	0.22	0.11	0.01		0.01	0.08	0.04		0.03	0.04	0.03	0.06	0.15	0.397
D. ashlandi		4.08	19.16	4.92	19.66	8.89	3.19	9.74	21.74	2.36	5.09	3.6	11.62	6.45	3.87	0.1	2.04	14.55	5.56	2.21	2.31	2.21	3.19	3.37	1.47	0.57	2.9	1.07	1.42	3.36	5.71	5.882
D. oregonensis				0.27						0.34	1.02	0.27									0.1		0.01	0.31	0.29				0.24	0.69	3.61	0.238
D. sicilioides												0.27																		0.22	0.6	0.036
D. sicilis																															0.29	0.010
D. minutus												0.56													0.59	0.07				0.69	2.1	0.134
D. leptopus																																
D. clavipes																																
Diaptomidae copepodids																																
Calanoida nauplii		7.05	9.63	11.71	15.79	19.49	6.38	13.23	37.86	8.5	9.68	12.65	14.26	11.05	24.5		16.49	29.03	18.81	11.88	8.95	8.29	3.91	6.18	4.23	9.79	1.13	0.53	2.21	11.61	14.05	11.636
D. c. bicuspidatus		0.43	0.49	0.11	0.65	0.29	2.28	2.5	5.17	1.53	2.04	4.22	1.94	0.16			2.64	2.58	1.21	1.11	4.82		0.97	2.91	1.88		0.64	1.6	1.66	2.77	2.82	1.648
A. vernalis		0.34	2.21	0.44	2.26	4.59	2.28	4.99	3.88	1.19	2.04	0.94	1.94	1.47	1.81	0.05	1.02	1.61	0.48	0.14	3.1		0.64	1.94		0.31	3.87	1.6		2.21	5.63	1.766
M. edax																																
M. albidus																																
E. agilis																																
Cyclopidae copepidids		0.85	2.46	0.44	1.61	0.57	33.25	3.74	5.81	14.81	46.86	30.5	1.69	0.55	2.06		3.14	4.2	3.39	2.9	23.4	7.74	29.36	6.58	56.31	28.43	9.66	47.53	45.91	48.66	10.2	15.764
Cyclopidae nauplii		4	10.07	3.87	28.99	7.45	25.05	11.49	29.69	17.01	26.48	42.48	11.61	3.13	11.09	0.1	14.29	10.97	10.16	9.13	16.49	21.28	17.74	8.91	26.28	42.03	4.36	40.05	42.59	21.01	13.02	17.661
D. retrocurva		0.25	1.22	0.66	3.55	2.92	1.36	2.75	6.31	1.36	1.53	1.42	0.48	1.28	3.09	0.1	1.87	2.59	1.69	0.55	0.69	0.28	0.64	0.78	1.88	0.63	0.33	1.07	1.66	4.97	1.4	1.644
D. g. mendotae		0.98	0.25	0.88	0.64	0.06	1.36	0.75	3.51	0.64	1.16		0.73	1.65	0.77		0.17	1.94	0.97	0.28	0.01	0.28	0.2	0.58		0.09	0.13	0.53	0.09	3.87	5.28	0.927
D. longiremis							5.02			0.34	4.08													0.58	1.41	0.03	0.16	1.6	3.31	1.66	5.98	0.806
D. parvula																																
D. ambigua																																
D. pulex																																
D. schoedleri																																
C. quadrangula																																
S. vetulus																																
B. longirostris		0.42	0.01	0.88	1.29	2.01	6.82	0.25	1.4	3.23	8.15	2.82	0.24	2.03	2.84	0.4	1.36	1.94	2.42	1.66	8.95	8.57	6.45	4.64	6.56	22.41	2.26	3.74	12.71	8.84	1.05	4.212
C. sphaericus							0.45					0.47				0.65						0.28	0.32	0.19			0.16				4.93	0.248
H. gibberum																																
D. feuchtenbergianum		0.08	0.96	0.44	2.69	0.29		0.75	0.7		0.03	0.47		0.18	0.26							0.01	0.01			0.31						0.247
S. crystallina																																
L. kindtii		0.020	0.004	0.020	0.150	0.020	0.020	0.030	0.050	0.030	0.050	0.290		0.200	0.130		0.020	0.010	0.050	0.010	0.030		0.010	0.030	0.060	0.090	0.006	0.010	0.010	0.090	0.020	0.050
A. guttata																																
L. quadrangularis																																
E. lamellatus																																
L. setifera																																
TOTAL CALANOIDA	Ind L^{-1}	11.88	31.50	18.29	40.64	30.14	9.65	23.09	66.05	11.48	16.10	17.82	26.09	20.09	28.55	0.15	18.58	45.22	26.06	14.59	11.45	10.51	7.16	10.71	6.67	10.74	4.06	1.84	3.93	16.76	26.57	18.84
TOTAL CYCLOPOIDA	Ind L^{-1}	5.62	15.23	4.86	33.51	12.90	62.66	22.72	44.55	34.54	77.42	76.14	17.18	5.33	14.96	0.15	21.09	19.36	15.24	13.28	46.81	29.02	48.71	20.34	64.47	70.77	15.55	90.75	90.16	74.65	31.67	36.83
TOTAL CLADOCERA	Ind L^{-1}	1.73	2.46	2.88	8.52	5.32	15.03	4.53	11.97	5.60	15.03	5.47	1.45	5.34	7.09	1.15	3.42	6.48	5.13	2.50	9.68	9.42	7.63	6.80	9.91	23.56	3.05	6.95	17.78	19.43	18.66	8.13
TOTAL CRUSTACEANS	Ind L^{-1}	19.23	49.19	26.03	82.67	48.36	87.54	50.34	122.6	51.62	108.6	101.4	44.72	30.76	50.60	1.45	43.09	71.06	45.43	30.37	67.94	48.95	63.50	37.85	101.1	105.1	25.66	99.37	111.9	110.8	76.90	63.80

Table 4. Abundance (individuals per litre) of crustacean plankton species at 37 stations in 8 regions of Lake Winnipeg, September 2 - 10, 1969. South and North basin means (weighted) also presented.

	Region	R									SB								W		South Basin (R,SB,W)
	Station	2	3	3c	4	60	60b	60c	61	62	5	6	10	12	14	57	58	59	7	8	(n = 19)
SPECIES																					Mean
L. macrurus														1		0.01		0.01			0.054
E. lacustris				0.07	0.35	0.04	0.1	0.04	0.04		0.01	0.18	0.73	0.28	1.09	1.82	3.12	1.01	0.01	0.01	0.468
E. nevadensis		0.35		0.28	1.19	0.03	0.28	0.29	0.04	0.2	0.06		0.38	0.04	1.01	0.87	0.22			0.01	0.276
D. ashlandi		83.94	4.9	8.34	51.12	11.92	17.78	35.61	39.57	84.59	10.33	2.46	16.02	16.07	19.79	23.09	98.83	25.37	0.06		28.936
D. oregonensis		8.39	0.54	9.12	2.56	0.61	0.32	0.99	2.41	2.38	2.44	0.94	1.02	0.87	1.21	1.27	5.62	1.95		0.01	2.245
D. siciloides		117.54	1.1	3.8	2.56	2.74		3.95	7.18	9.67	1.21	1.89		0.29				1.31			8.065
D. sicilis																					
D. minutus																					
D. leptopus																					
D. clavipes																					
Diaptomidae copepodids																					
Calanoida nauplii		80.18	3.7	12.36	20.88	21.32	7.96	18.72	27.08	49.26	10.19	6.81	25.13	9.1	13.47	14.96	7.11	14.01	0.01	0.34	18.032
D. c. bicuspidatus																			0.01		0.001
A. vernalis		69.94	4.26	27.7	6.4	4.72	2.13	11.95	14.05	25.58	9.72	2.82	1.07	1.16	6.2	6.16	12.8	11.88	0.01	0.05	11.505
M. edax												0.01									0.001
M. albidus																			0.01		0.001
E. agilis											0.24				0.54	0.29					0.146
Cyclopidae copepodids		1.7									8.54	4.82	3.2	5.62	8.62	14.38	4.27	5.48		0.19	16.576
Cyclopidae nauplii		80.18	12.08	34.5	8.94	3.59	3.37	40.04	32.6	44.53	0.24	0.24	0.85	0.19	2.69	0.29		0.61	0.01	0.03	1.209
D. retrocurva		3.42	0.84	5.96	0.42		0.72	2.6	1.02	2.85	4.97	2.35		1.16	2.14	2.93	12.8	3.35		0.04	4.688
D. g. mendotae		20.46	1.12	2.14	4.7	1.58	3.56	14.56	5.52	5.69											
D. longiremis																					0.011
D. parvula			0.14	0.06																	
D. ambigua																					
D. pulex																					
D. schoedleri										0.03									0.01		0.295
C. quadrangula		5.12	0.42	0.03																	
S. vetulus												0.35	0.21	0.97	1.07	0.88			0.01	0.03	0.286
B. longirostris			0.28			1.13			0.51												
C. sphaericus																			0.01		0.001
H. gibberum																					
D. leuchtenbergianum		13.64		2.13	2.56	0.45	0.17	1.56	1.51	6.62	0.94	0.47	1.28	0.19	0.54	0.59	2.13	1.83		0.01	1.927
S. crystallina																					
L. kindtii		0.030	0.010	0.030	0.030			0.020		0.200	0.010	0.003	0.006		0.020		0.030			0.060	0.024
A. guttata																			0.01		0.001
L. quadrangularis																					
E. lamellatus																					
L. setifera																					
CALANOIDA TOTAL	ind L-1	290.40	10.24	33.97	78.66	36.66	26.46	59.60	76.32	146.10	24.24	12.28	43.28	27.65	36.57	42.02	114.90	43.66	0.08	0.37	58.08
CYCLOPOIDA TOTAL	ind L-1	151.82	16.34	62.20	15.34	8.31	5.50	51.99	46.65	70.11	18.50	7.65	4.27	6.78	15.36	20.83	17.07	17.36	0.03	0.24	28.23
CLADOCERA TOTAL	ind L-1	42.67	2.81	10.35	7.71	3.16	4.45	18.74	8.56	15.39	6.16	3.41	2.35	2.51	6.46	4.69	14.96	5.79	0.05	0.17	8.44
TOTAL CRUSTACEANS	ind L-1	484.89	29.39	106.52	101.71	48.13	36.41	130.33	131.53	231.60	48.90	23.34	49.90	35.94	58.39	67.54	146.93	66.81	0.16	0.78	94.69

Table 4 (cont.).

Region	NBw			NBe				NBn			S			North Basin (NBw,NBe,NBn,S)
Station	45	39	64	18	19	21	50c	22	23c	31	25	26	28	(n = 13)
SPECIES														Mean
L. macrurus		0.09	0.1	0.05	0.01	0.01	0.18					0.01		0.029
E. lacustris	0.98	0.26	0.29	0.14	0.1	0.34	0.61		0.1	0.07	0.03		0.19	0.313
E. nevadensis	0.59	0.12	0.09	0.14	0.06	0.05	0.54	0.01	0.02		0.02	0.32		0.137
D. ashlandi	7.98	5.68	9.59	9.62	5.52	17.16	11.8	8.91	3.33	1.56	2.41	3.92		7.157
D. oregonensis	0.72	0.58	0.2	0.88	0.17	1.07		2.99	2.65	0.42	2.64	1.59	3.08	1.074
D. siciloides									1.32		1.53	0.19	0.27	0.184
D. sicilis				0.03		0.54	0.2							0.072
D. minutus		0.19				2.68		0.89	0.99	0.06	1.11	0.29	0.7	0.384
D. leptopus														
D. clavipes														
Diaptomidae copepodids														
Calanoida nauplii	21.49	12.88	14.39	8.99	4.41	21.06	16.55	8.1	7.54	4.57	4.55	8.81	1.16	11.102
D. c. bicuspidatus	6.14	2.15		1.2	2.47	15.32		13.64	3.9	3.47	2.27	1.42	0.19	2.898
A. vernalis	14.33	3.44	2.8	6.99	0.96	11.11	3.31	13.21	5.46	2.36	8.24	5.69	5.82	5.931
M. edax													0.39	0.022
M. albidus														
E. agilis														
Cyclopidae copepodids	4.1	2.58		2.2	1.72	18.38	0.42	23.45	8.06	3.31	6.82	3.98	0.19	4.223
Cyclopidae nauplii	54.74	24.72	16.59	12.39	7.2	42.5	51.32	57.56	20.79	17.64	17.91	20.75	4.45	24.613
D. retrocurva	1.02	1.08		0.2	0.22	1.15		2.99	0.78		2.87	0.29		0.651
D. g. mendotae	2.04	1.51	0.8	1.4	1.07	3.45	0.83	0.43	1.82	0.48	1.99	4.83		1.367
D. longiremis					0.01	0.06		4.27		0.63		0.57		0.308
D. parvula														
D. ambigua														
D. pulex														
D. schoedleri														
C. quadrangula													0.01	0.001
S. vetulus													0.19	0.011
B. longirostris		0.22						0.43	0.26			0.29	9.88	0.748
C. sphaericus	0.51								3.9		5.69	4.83	14.54	1.637
H. gibberum														
D. leuchtenbergianum	0.65	0.43	0.6	0.4	0.11	2.3		0.43	1.04	0.16	1.13	0.85	0.77	0.622
S. crystallina														
L. kindtii		0.020		0.009	0.009	0.050		0.040	0.009		0.010	0.010	0.040	0.012
A. guttata														
L. quadrangularis														
E. lamellatus														
L. setifera														
CALANOIDA TOTAL ind L-1	31.76	19.80	24.66	19.85	10.27	42.91	29.88	20.90	15.95	6.68	12.29	15.13	5.40	20.45
CYCLOPOIDA TOTAL ind L-1	79.31	32.89	19.39	22.78	12.35	87.31	55.05	107.86	38.21	26.78	35.24	31.84	11.04	37.69
CLADOCERA TOTAL ind L-1	4.22	3.26	1.40	2.01	1.42	7.01	0.83	8.59	7.81	1.27	11.69	11.67	25.43	5.36
TOTAL CRUSTACEANS ind L-1	115.29	55.95	45.45	44.64	24.04	137.23	85.76	137.35	61.97	34.73	59.22	58.64	41.87	63.49

Table 5. Abundance (individuals per litre) of crustacean plankton species at 49 stations in 8 regions of Lake Winnipeg, October 3 - 13, 1969. South and North basin means (weighted) also presented.

Region		R										SB									W		South Basin (R,SB,W)
Station		2	3	3c	4	60	60b	60c	61	62	63	5	6	9	10	12	14	57	58	59	7	8	(n = 21)
SPECIES																							Mean
L. macrurus				0.13	0.01	0.01		0.49				0.18	0.69	0.12	0.07	0.15	0.14	0.02	0.1	0.01		0.13	0.107
E. lacustris		0.02	0.09			0.01	0.01	0.04			0.07		0.02		0.04	0.03	0.07						0.019
E. nevadensis		4.11	4.7	3.56	5.44	18.52	5.9	18	4.9	0.11	0.74	3.26	8.97	5.22	6.98	5	17.6	4.42	4.56	3		0.01	5.952
D. ashlandi		1.47	1.75	3.2	0.35	5.44		9.9	1.23		0.06	5.21	3.84	0.28	1.05	0.5	1.47	5.89	2.46	3.46		0.05	2.267
D. oregonensis		2.05	6.45	2.49	3.75	3.27	9.58	0.9	3.28	0.06	0.74												1.551
D. siciloides																							
D. sicilis																							
D. minutus																							
D. leptopus		0.01					0.01				0.06												0.004
D. clavipes																					0.03		0.001
Diaptomidae copepodids																					0.01	0.04	3.614
Calanoida nauplii		3.62	4.37	3.6	3.79	11.47	6.85	4.6	4.98	0.14	1.78	4.51	3.7	1.15	2.54	1.62	5.7	3.79	6.09	1.55			0.016
D. c. bicuspidatus			0.25								0.08											0.03	3.779
A. vernalis		8.45	12.9	3	2.95	8.89	6.41	9.68	4.84	0.23	3.62		0.5	0.25	2.45	2.07	4.5	1.68	2	4.91	0.01	0.01	0.001
M. edax									0.01													0.01	0.000
M. albidus																							
E. agilis																							
Cyclopidae copepodids		0.4	1.03		0.15			0.24			0.08	0.09			0.08		0.3			0.39			0.131
Cyclopidae nauplii		7.04	16.93	3.71	6.16	9.47	10.4	2.18	5.66	0.37	4.2	2.07	1.9	3.5	2.7	3.87	4.8	6.42	2.6	7.1		0.06	4.816
D. retrocurva		0.2		0.22	0.43	1.44	0.21	0.97	0.14	0.03			0.5						0.1		0.02	0.01	0.203
D. g. mendotae		1.8	0.53	2.91	0.43	1.14	0.66	0.24	0.96	0.03	0.38	0.72	0.2	0.01	0.24	0.09	0.16	0.11	0.3	0.65	0.01	0.01	0.551
D. longiremis																							0.020
D. parvula		0.01	0.25		0.15																		
D. ambigua																							
D. pulex																							
D. schoedleri																							0.027
C. quadrangula		0.02	0.25				0.21		0.01		0.08												
S. vetulus																							
B. longirostris		1.4	3.35	0.71	1.4	0.56	3.31	1.94	1.8	0.23	2.22	2.43	1	0.05	1.72	0.72	1.66	3.16	1.4	2.58	0.01	0.03	1.510
C. sphaericus																							
H. gibberum																							0.138
D. leuchtenbergianum		0.2	0.25	0.11	0.15		0.44	0.24	0.14	0.03		0.36	0.2			0.18	0.16	0.11	0.2	0.13		0.01	0.000
S. crystallina																							0.004
L. kindtii		0.016		0.030	0.003	0.008	0.010	0.010															
A. guttata																							
L. quadrangularis			0.25						0.01									0.11		0.01	0.01		0.019
E. lamellatus																							
L. setifera																							
CALANOIDA TOTAL	ind L-1	11.28	17.36	12.98	13.34	38.72	22.35	33.93	14.39	0.31	3.45	13.16	17.22	6.77	10.68	7.30	24.98	14.12	13.21	8.02	0.04	0.23	13.52
CYCLOPOIDA TOTAL	ind L-1	15.89	31.11	6.71	9.26	18.36	16.81	12.10	10.51	0.60	7.98	2.16	2.40	3.75	5.23	5.94	9.60	8.10	4.60	12.40	0.01	0.11	8.74
CLADOCERA TOTAL	ind L-1	3.65	4.88	3.98	2.56	3.17	4.84	3.40	3.06	0.32	2.68	3.51	1.90	0.06	1.96	0.99	1.96	3.49	2.00	3.37	0.05	0.06	2.47
TOTAL CRUSTACEANS	ind L-1	30.82	53.35	23.67	25.16	60.25	44.00	49.43	27.96	1.23	14.11	18.83	21.52	10.58	17.87	14.23	36.56	25.71	19.81	23.79	0.10	0.40	24.73

Table 5 (cont.).

Region		Narrows					NBw					NBe							NBn						S				North Basin (NBw,NBe,NBn,S)
Station		16	54	52	58	59	39	41	43	45	64	17	18	19	20	21	48	50c	22	23c	23	31	33	35	25	26	27	28	29	(n = 28)
SPECIES																														Mean
L. macrurus		0.01	0.01	0.03	0.04	0.02	0.01				0.02	0.17	0.04	0.07	0.19	0.01	0.05	0.02	0.02	0.01	0.01				0.01	0.01				0.027
E. lacustris		0.16	0.09	0.29	0.07	0.114	0.03	0.01	0.16			0.01	0.01	0.01	0.01			0.06	0.01	0.6	0.04	0.03	0.09	0.02	0.05	0.02				0.066
E. nevadensis		0.03	0.01	0.01		0.02	0.03		0.07		0.01	0.01	0.01	0.01	0.01		0.02			0.01	0.02	0.02	0.01		0.02	0.02		0.01		0.013
D. ashlandi		5.06	6.55	3.74	6.49	4.5	0.4	2.39	4.73	0.15	7.01	5.46	2.28	8.88	11.73	8.06	2.5	4.9	9.46	3.53	2.81	2.69	8.69	0.47	6.25	3.61	2.97	0.62	0.15	4.514
D. oregonensis		0.25	0.42	0.56	0.16	0.87	0.56	1.74	1.48	1.41					0.01	0.56	0.09	0.15		2.36	0.31	1.35	3.04	1.05	1.5	1.52	0.48	0.93	2.43	0.829
D. sicilioides					0.16		0.04		0.6	0.15												0.01		0.01			0.12			0.039
D. sicilis					0.16		0.04				0.39				0.03	0.19	0.09							0.09						0.035
D. minutus										0.08				0.23					0.27								0.01			0.021
D. leptopus																														
D. clavipes																														
Diaptomidae copepodids																														
Calanoida nauplii		1.96	2.3	3.85	1.36	0.17	1.73	2.07	0.28	0.74	1.24	2.16	0.72	0.97	3.23	2.06	0.97	1.85	1.33	2.69	1.62	3.35	5.76	0.59	1.29	0.87	1.48	0.28	0.85	1.715
D. c. bicuspidatus							0.09	0.86	0.15	0.16	0.69			0.29	0.48	0.12	0.33		0.29	0.83	0.62	0.53	1.33	0.29	2.19	1.42	0.43	0.42		0.406
A. vernalis		1.56	1.64	2.28	0.59	0.72	5.83	11.53	4.06	3.76	3.67	8.5	1.68	6.66	8.85	3.14	10.01	1.49	9.73	22.71	11.19	7.56	3.1	8.11	7.49	5.29	1.72	4.36	10	6.015
M. edax																														
M. albidus																														
E. agilis																														
Cyclopidae copepodids			0.2	0.09	0.13	0.17	0.82	1.72	0.15	0.65	0.14	0.37		0.19	1.29	2.42	0.97	0.09	2.07	10.73	4.16	3.7	5.53	1.33	3.67	1.11	0.62	0.56	1.3	1.585
Cyclopidae nauplii		3.89	1.25	5.09	0.3	0.17	8.2	16.16	2.78	5.16	1.94	4.01	7.27	2.23	5.81	8.59	7.85	3.61	10.03	29.32	24.96	14.61	11.72	16.37	11.1	3.4	4.07	5.07	16.78	8.278
D. retrocurva			0.66					0.17	0.15	0.01												0.01		0.15						0.041
D. g. mendotae		0.24		0.09	0.01	0.06	0.63	0.86	3.88	0.65	0.07	0.24		0.09	0.16	0.12	0.32	0.05		4.54	0.78	1.22	0.65	2.21	0.64	0.08	0.19		0.33	0.647
D. longiremis										0.08												0.53		0.15						0.027
D. parvula																														
D. ambigua																														
D. pulex																														
D. schoedleri																														
C. quadrangula																														
S. vetulus																														
B. longirostris		0.28	0.32	0.09	0.36	0.61	0.55	2.41	1.53	3.27	0.14			0.09			0.64	0.05		5.37	1.62	3.16	0.21	1.77	0.13		0.12	7.6	16.15	1.656
C. sphaericus								5.65	2.9	2.66										6.61	1.04	0.35	0.89	2.8	0.13			6.05	21.3	1.808
H. gibberum																														
D. leuchtenbergianum		0.11					0.18	0.17	0.15	0.16	0.04		0.06			0.12	0.21				0.78	0.36	0.89	0.15	0.13	0.24	0.18			0.140
S. crystallina																														
L. kindtii																						0.008			0.006			0.008	0.045	0.002
A. guttata																														
L. quadrangularis																														
E. lamellatus																				0.01										0.000
L. setifera																														
CALANOIDA TOTAL	ind L-1	7.46	9.38	8.47	8.44	5.69	2.84	6.21	7.32	2.53	8.67	7.63	3.06	10.17	15.21	10.90	3.72	7.00	11.09	9.70	5.01	7.45	17.59	2.23	9.12	6.05	5.06	1.84	3.23	7.26
CYCLOPOIDA TOTAL	ind L-1	5.47	3.09	7.46	1.02	1.06	14.84	30.29	8.06	9.73	6.84	12.85	8.95	9.39	16.46	14.27	19.16	5.19	22.12	63.59	40.65	28.40	21.68	28.10	24.65	11.22	6.84	10.41	28.08	16.29
CLADOCERA TOTAL	ind L-1	0.58	0.98	0.18	0.39	0.67	1.36	9.29	8.61	7.03	0.25	0.24	0.06	0.18	0.16	0.24	1.17	0.10		16.53	4.42	5.63	2.64	7.23	1.04	0.32	0.49	13.66	37.83	4.33
TOTAL CRUSTACEANS	ind L-1	13.53	13.45	16.11	9.85	7.42	19.14	45.79	23.99	19.29	15.56	20.95	12.07	19.74	31.83	25.41	24.05	12.29	33.21	89.82	50.28	39.48	41.91	35.56	34.81	17.59	12.39	25.91	69.14	27.88

Table 6. Abundance (individuals per litre) of crustacean plankton species at 25 stations in 8 regions of Lake Winnipeg, October 27 - 31, 1969. South and North basin means (weighted) also presented.

Region		R				SB					W		South Basin (R,SB,W)
Station		2	4	60	61	6	10	11	14	59	7	8	(n = 11)
SPECIES													Mean
L. macrurus							0.01						0.001
E. lacustris			0.01			0.02	0.02	0.02	0.02				0.008
E. nevadensis				0.01			0.01			0.01			0.003
D. ashlandi		1.58	13.54	0.25	1.03	0.26	4.76	8.85	2.21	2.28	0.01		3.161
D. oregonensis				0.11	0.66	0.03	0.14	0.89		0.3			0.194
D. siciloides		0.28	4.66	0.08	0.19	0.05					0.01		0.479
D. sicilis													
D. minutus													
D. leptopus			0.01										0.001
D. clavipes													
Diaptomidae copepodids											0.01	0.01	0.002
Calanoida nauplii		0.9	3.48	0.59	1.16	0.04	0.26	0.89	0.2	0.33			0.714
D. c. bicuspidatus		0.08			0.06								0.013
A. vernalis		0.2	3.68	1.95	2.77	0.11	0.62	3.06	0.65	0.81	0.01	0.01	1.261
M. edax													
M. albidus													
E. agilis													
Cyclopidae copepodids		0.43	4.26	0.41	0.55	0.17	0.57	0.96	0.26	0.37	0.01	0.01	0.727
Cyclopidae nauplii		2.83	3.87	3.17	4.48		1.91	2.87	0.39	1.77			1.935
D. retrocurva				0.04						0.01			0.005
D. g. mendotae		0.02	0.96	0.06	0.11	0.01	0.01	0.06	0.01	0.02			0.116
D. longiremis													
D. parvula													
D. ambigua													
D. pulex													
D. schoedleri													
C. quadrangula													
S. vetulus													
B. longirostris		2.15	3.29	1.11	1.05	0.07	0.57	1.33	0.09	0.29	0.01		0.905
C. sphaericus													
H. gibberum													
D. leuchtenbergianum			0.01	0.01	0.03		0.01	0.06		0.01			0.012
S. crystallina													
L. kindtii													
A. guttata													
L. quadrangularis										0.01			0.001
E. lamellatus													
L. setifera													
CALANOIDA TOTAL	ind L-1	2.76	21.70	1.04	3.04	0.40	5.20	10.65	2.43	2.92	0.03	0.01	4.56
CYCLOPOIDA TOTAL	ind L-1	3.54	11.81	5.53	7.86	0.28	3.10	6.89	1.30	2.95	0.02	0.02	3.94
CLADOCERA TOTAL	ind L-1	2.17	4.26	1.22	1.19	0.08	0.59	1.45	0.10	0.34	0.01		1.04
TOTAL CRUSTACEANS	ind L-1	8.47	37.77	7.79	12.09	0.76	8.89	18.99	3.83	6.21	0.06	0.03	9.54

Table 6 (cont.).

Region		Narrows					NBw		NBe			NBn		S		North Basin (NBw,NBe,NBn,S)
Station		16	54	54b	68	69	39	64	20	21	48	22	23c	25	28	(n = 14)
SPECIES																Mean
L. macrurus		0.01	0.01		0.05	0.01	0.01	0.03	0.03	0.11	0.09	0.01	0.01			0.026
E. lacustris		0.02	0.01	0.01	0.01	0.03	0.01	0.01	0.05	0.01			0.01			0.012
E. nevadensis		0.01	0.01	0.03	0.01		0.01	0.01	0.05			0.01	0.01	0.01		0.011
D. ashlandi		3.99	2.67	2.86	4.12	6.13	1.85	4.4	6.75	25.8	4.46	1.36	0.23	1.31	0.73	4.761
D. oregonensis			0.01	0.1	0.09	0.18		0.09	0.17	0.02	0.01	0.12	0.1	0.51	0.73	0.152
D. siciloides																
D. sicilis			0.01		0.09		0.05	0.09		0.01			0.01			0.019
D. minutus																
D. leptopus																
D. clavipes																
Diaptomidae copepodids																
Calanoida nauplii		0.27	0.07	0.07	0.29	0.69	0.47	0.17	0.74	2.82	0.44	0.25		0.08	0.12	0.463
D. c. bicuspidatus								0.04	0.09	0.7	0.04	0.08	0.04	0.08		0.076
A. vernalis		0.85	0.09	0.36	0.59	0.87	2.84	1.03	2.95	11.73	1.85	2.38	0.61	2.76	1.41	2.165
M. edax																
M. albidus																
E. agilis																
Cyclopidae copepodids		0.03	0.13	0.05		0.05	1.49	0.47	1.01	3.05	0.33	0.64	0.14	1.03	0.68	0.650
Cyclopidae nauplii		0.25	0.05	0.13	0.44	0.6	3.88	1.51	5.26	34.74	0.99	4.38	1.36	5.53	6.33	4.675
D. retrocurva										0.01					0.03	0.003
D. g. mendotae		0.01			0.01		0.01	0.01	0.08	0.11		0.24	0.11	0.23	0.3	0.079
D. longiremis										0.01			0.02			0.002
D. parvula																
D. ambigua																
D. pulex																
D. schoedleri																
C. quadrangula																
S. vetulus																
B. longirostris		0.03	0.04	0.03	0.04		0.1	0.04		0.24		0.51	0.64	1.98	3.69	0.524
C. sphaericus												0.05	0.34	0.55	0.31	0.089
H. gibberum																
D. leuchtenbergianum		0.01					0.01		0.02	0.04	0.01		0.01			0.007
S. crystallina																
L. kindtii																
A. guttata																
L. quadrangularis																
E. lamellatus																
L. setifera																
CALANOIDA TOTAL	ind L-1	4.30	2.79	3.07	4.66	7.04	2.40	4.80	7.79	28.77	5.00	1.75	0.37	1.91	1.58	5.44
CYCLOPOIDA TOTAL	ind L-1	1.13	0.27	0.53	1.03	1.52	8.21	3.05	9.31	50.22	3.21	7.48	2.15	9.40	8.42	7.57
CLADOCERA TOTAL	ind L-1	0.05	0.04	0.03	0.05		0.12	0.05	0.10	0.41	0.01	0.80	1.12	2.76	4.33	0.70
TOTAL CRUSTACEANS	ind L-1	5.48	3.10	3.63	5.74	8.56	10.73	7.90	17.20	79.40	8.22	10.03	3.64	14.07	14.33	13.72

Table 7. Settled net plankton volumes ($mm^3 L^{-1}$) in Lake Winnipeg, June to October 1969.

Region	Station	Date June 4–12	July 9–16	July 24 Aug 1	Sept 2–10	Oct 3–13	Oct 27–31
R	1		10.20				
	2	6.40	7.10		44.91	7.47	5.28
	3		8.51	14.51	8.42	15.40	
	3c		8.51	8.05	9.83	6.08	
	4		8.51	9.85	25.25	4.56	6.34
	60	8.89	13.61	8.94	4.43	5.32	1.69
	60b		3.78	13.52	4.77	4.89	
	60c			8.11	10.27	6.84	
	61	4.00	6.62	10.81	11.55	5.13	
	62	7.12	13.92	28.72	23.39	3.16	
	63	5.34	11.24	8.89		10.95	
	Mean	6.35	9.20	12.38	15.87	6.98	4.44
W	7	2.66	2.00		4.04	1.23	3.17
	8	2.88	2.60	2.77	3.34	0.61	2.37
	Mean	2.77	2.30	2.77	3.69	0.92	2.77
SB	5	11.52	20.36	5.74	5.90	3.10	
	6	6.40	11.03	11.04	2.71	3.10	1.35
	9		6.79	7.41		2.06	
	10	7.68	10.19		4.42	3.38	3.36
	11						4.49
	12	2.57	7.40	10.12	4.03	1.24	4.04
	13	6.40					
	13b		16.97				
	14		13.57	8.24	9.33	2.65	2.02
	57	7.12	17.28	2.53	5.42	3.72	
	58		11.88	14.42	16.41	8.25	
	59	8.22		7.07		2.48	4.71
	Mean	7.13	12.83	8.32	6.89	3.33	3.33
N	16	1.68	2.50	5.19	2.43	1.87	2.37
	52	10.22	2.62	5.14	2.50	2.80	
	54	1.81	2.81	7.78	2.53	1.87	2.10
	54b						1.90
	68		2.89	3.95	2.31	3.44	1.75
	69		2.39	5.34	3.43	2.23	
	Mean	4.57	2.64	5.48	2.64	2.44	2.03
NBe	17	2.28	3.78	2.97		4.10	
	18	2.35		3.75	9.70	2.13	
	19	1.58	4.96	3.75	6.83	4.65	
	20		4.26	2.15		8.65	2.76
	21	6.04	6.03	7.43	13.15	5.32	6.68
	48	18.40	2.68	3.22		5.66	2.21
	50						
	50b		4.86	9.29			
	50c		4.64	6.86	25.09	3.19	
	51			4.29			
	Mean	6.13	4.46	4.86	13.69	4.82	3.88
NBw	39	11.40		3.02	16.73	6.27	2.21
	41	13.85	4.54	3.66		14.19	
	43	15.98		11.69		37.27	
	45	7.04	3.06	2.97	8.28	14.52	
	47	13.97					
	64		4.26	7.19	6.47	2.67	3.30
	65			7.51			
	Mean	12.45	3.95	6.01	10.50	14.98	2.76
NBn	22	4.63	6.81	3.67	10.33	2.83	5.09
	23						
	23c		14.69	2.95		26.98	3.44
	23e	4.63	2.68	2.68		16.91	
	24	4.65					
	31	2.28	7.23	3.50	5.56	5.81	
	33	2.85	5.34	3.67		3.04	
	35	2.66	6.74	2.68		14.90	
	Mean	3.61	7.25	3.19	7.95	11.75	4.27
S	25	6.79	4.08	3.00	12.37	4.34	4.99
	26	6.79	6.03	4.66	12.37	3.09	
	27		5.62			4.22	
	28	7.01	5.96	4.94	8.43	8.21	2.99
	29					27.09	
	Mean	6.86	5.42	4.20	11.06	9.39	3.99